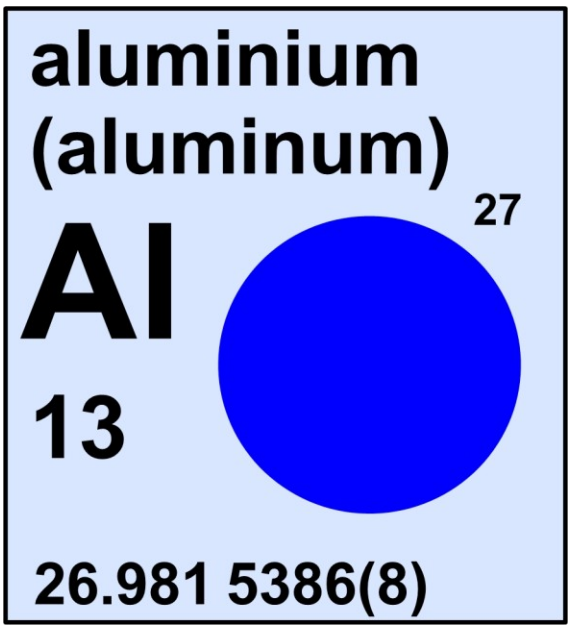
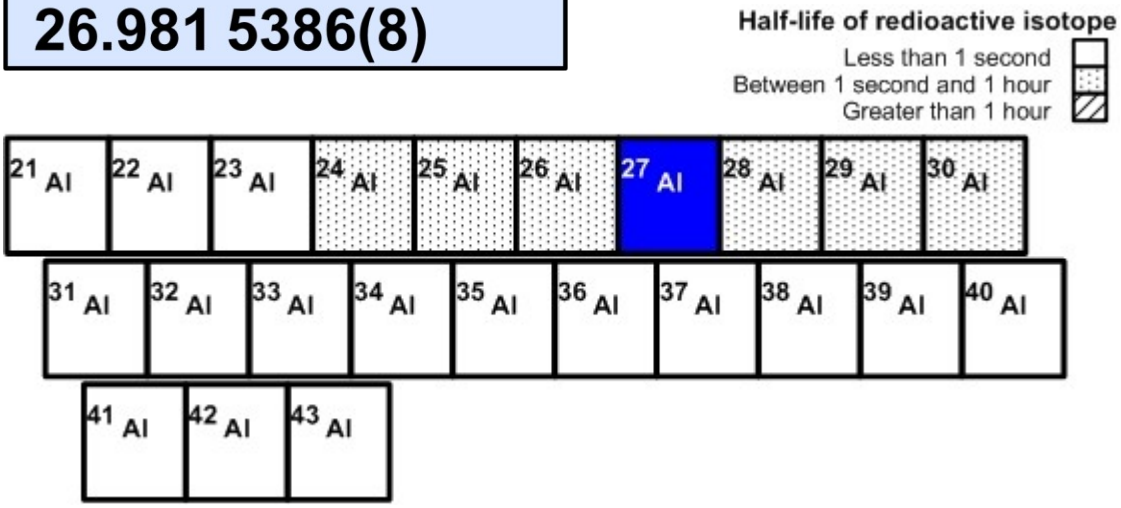
aluminium



Stable isotope	Atomic mass*	Mole fraction
^{27}Al	26.981 538 63	1.0000

* Atomic mass given in unified atomic mass units, u.



Important applications of stable and/or radioactive isotopes

Isotopes in geology

1) ^{26}Al is produced from argon in the atmosphere by interaction with protons from cosmic-ray*s*. It can be used for dating of geological samples such as marine sediments, manganese nodules, rocks and meteorites.

Isotopes in hydrology

1) The ratio of ^{26}Al to ^{10}Be can be used to study erosion and transport of soil and sediments in the recent Earth's history (100,000 to million year time scale).

Figure 1: Soil Erosion.

Isotopes in planetary sciences

1) Intense cosmic ray bombardment in space produces ^{26}Al in meteorites and other bodies such as the moon. After falling to Earth, ^{26}Al production ceases due to atmospheric shielding and the decay of ^{26}Al to ^{26}Mg can be used to determine the meteorites terrestrial age, i. e. the time elapsed since the meteorite has fallen on Earth.

Isotopes in tracer studies

1) ^{26}Al is very a long living radioisotope (half-life of 7.2×10^5 years) that can be detected at the ultra trace level (atto-gram range) using accelerator mass spectrometry. ^{26}Al is used as a tracer to study uptake, distribution and retention of Al in plants, animals and man under physiological conditions.